I. SIMILARITY OF SUPPLY AND DEMAND SHOCKS BETWEEN THE NEW MEMBER STATES AND THE EURO ZONE. THE CASE OF ROMANIA

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Abstract

This paper assesses the correlation of supply and demand shocks between New Member States (NMS), including Romania, and the Eurozone. Using a structural VAR approach, we estimated the similarity between demand (both nominal and real) and supply shocks between NMS and the Eurozone, showing that the demand shocks are still negatively correlated with the Eurozone for some NMS, including Romania. Also, using a moving window, we estimated that the correlation of shocks increased over time, especially in the case of supply shocks. Even for some core members of the Eurozone, we find that the demand shocks seem to be idiosyncratic. The main conclusion of our paper is the fact that Romania, as well as some other NMS countries, still need time to become more synchronized and to avoid the occurrence of asymmetric shocks once they become members of the Eurozone.

Keywords: optimal currency area, supply and demand shocks, business cycle synchronization, euro adoption, convergence

JEL Classification: E32, F42

1. Introduction

The Optimum Currency Area theory (OCA) is very often used as a starting point to analyze the readiness of a member country of European Union to adopt euro. The symmetry of the shocks which are striking the economies (normally, the candidate

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country to euro adoption and the Eurozone as a region) is one of the important criteria highlighted by the OCA theory. The Optimal Currency Area (OCA) theory was introduced in the seminal papers of Mundell (1961, 1973).

More recently, Bayoumi (1994) proposed a model of optimal currency areas with microeconomic foundations to support Mundell's original idea. He stressed that the condition for an OCA is that members of the currency union should experience symmetric shocks.

Generally speaking, according to the OCA theory, when a country wants to join monetary union, criteria such as the convergence of economic structures, business cycle synchronization, demand and supply shocks correlation, labour market and market flexibility, in general, degree of financial intermediation, level of economic openness, etc., should be considered. According to the literature (Cohen and Wyplosz, 1989; Weber, 1990; European Commission, 1990), a very important criterion is the similarity of supply and demand shocks and business cycles in countries using a common currency (or having their exchange rates fixed). Monetary and exchange rate policy cannot be used as a stabilization tool if a member country is, for example, hit by an asymmetric shock. Hence, business cycles of countries considering creation of a currency area must be correlated to a maximum extent. The direction of the development of synchronization of business cycles of two economies in the future is fundamentally determined by how such economies respond to demand and supply shocks. If they respond rather symmetrically, such economies are likely to get synchronized over time.

When participating to a monetary union, a single monetary policy is performed by a common central bank. If asymmetric shocks strike the member countries of the monetary union, the monetary policy, which is common for all the members, cannot be used as an adjustment mechanism. If the shocks are asymmetric, it is better for a country to be outside the monetary union, as each country can be able to use its own monetary policy to adjust the economy to the asymmetric shocks. For example, if a negative demand shock occurs, a stimulative monetary policy would reduce the decline in output. Also, if a negative supply shock occurs, a tight monetary policy would reduce the increase in prices.

A common monetary policy cannot accommodate the shocks which affect asymmetrically the member countries of the union. The alternative is to use other adjustment mechanisms (like labour market flexibility) to rely on in order to preserve the optimal currency area or, in the extreme scenario, to exit from the common currency area. If the shocks are symmetric, there is no issue with the optimality of the currency area.

When the number of member countries of the Eurozone is increasing, the probability of occurrence of asymmetric shocks is naturally increasing (Gilson, 2006). Nevertheless, Gilson (2006) argues that we cannot say that each new accession to the Eurozone would jeopardize the stability of the European monetary union, because this kind of judgment completely ignores the possibility to use national budgetary policies to adjust the shocks and the size of those asymmetries.

Several studies have been devoted in the literature to the analysis of similarities in the shocks affecting the EU countries. An important contribution came from Bayoumi and Eichengreen (1992), when they used data from 11 European Union member countries to extract information on underlying aggregate supply and demand disturbances using VAR decomposition. The two authors recover the underlying demand and supply disturbances using the technique developed by Blanchard and Quah (1989). The basic idea is that an economy can be hit by two types of shocks, namely demand shocks and supply shocks. Shocks are identified with the help of the restriction that their long-term impact of demand shocks on output is zero. Only supply shocks can have a permanent effect on output. Bayoumi and Eichengreen (1992) estimate two-variable vector autoregression (VAR) models for real GDP and GDP deflator. Demand and supply shocks are then recovered from the residuals of the VARs with the help of the aforementioned restriction. Correlation coefficients of different shocks between countries are used to assess the degree of similarity between the business cycles.

Bayoumi and Eichengreen (1992) find that underlying shocks are significantly more idiosyncratic across the EU countries than across US regions, which result may indicate that the EU will find more difficult to operate a monetary union. However, a core of European Union countries consisting of Germany and its immediate neighbours experience shocks of similar magnitude and cohesion as the US regions. The EU countries also exhibit a slower response to aggregate shocks than the US regions, presumably reflecting lower factor mobility.

Using data from mid-1990s to 2000 for ten CEE countries, Fidrmuc and Korhonen (2001) found that Hungary had the most correlated demand and supply shocks with the Euro area as a whole, while at the same time, the correlation of shocks varied considerably between the Eurozone and the accession countries. When taken individually, Hungary has the highest correlation in supply shocks, while Poland has the maximum correlation among the investigated countries for demand shocks. The least correlated are the Baltic countries, namely Lithuania and Latvia for the demand shocks and Lithuania for the supply ones.

Frenkel and Nickel (2002) conclude in their study that "there are still differences in the shocks and in the adjustment to shocks between the Eurozone and the CEECs. However several individual CEECs exhibit shocks and shock adjustment processes that are fairly similar to some euro area countries".

Horvath and Ratfai (2004), using quarterly data for the 1993-2000 period, show that the degree of correlation among the eight new EU members is significant, but there is a low correlation of these economies shocks with the Eurozone's core economies. Based on these, they argue that the integration of these countries into the Eurozone will be costly.

The main goal of our paper is to estimate the demand and supply shocks for the EU countries and to see if there is a similarity in shocks or not. The paper is organized as follows. The next section presents the theoretical and methodological considerations used for identifying the aggregate supply and demand shocks. In the third section of the paper, we present the data and proceed to the empirical estimation. The fourth section presents some concluding remarks.

2. Models used and estimation methodology

In our first approach, with two variables, in order to identify the supply and demand shocks we used in our analysis a methodology similar to Blanchard and Quah (1989) and Bayoumi and Eichengreen (1992).

The theoretical aggregate demand and supply model provides two distinct features of the original shocks affecting the economy. First, only supply shocks have permanent effect on output, property that will be used for the definition of structural models (VARs). Second, positive demand shocks raise prices while positive supply shocks reduce the price level, which property is called by Bayoumi and Eichengreen (1992) as an overindentifying condition.

The method used to recover supply and demand shocks is presented below for a structural vector autoregressive (VAR) model with two variables (GDP growth rate and GDP deflator).

As we described above, supply shocks have a permanent effect on the output, whereas demand shocks have only transitory effects on output. On the other hand, both supply and demand shocks have permanent effects on the price level. A supply shock decreases the price level, whereas a demand shock increases it.

As we mentioned previously, the method used to separate supply and demand shocks is similar to Blanchard and Quah (1989). They estimated a two-variable VAR with GNP and unemployment, and proceeded to identify the two aforementioned shocks. Similarly to our analysis, Bayoumi and Eichengreen (1993) estimated a VAR with the differences of GDP and the price level (in logs) as variables. The joint process of the two variables (GDP and prices) can also be written as an infinite moving average representation of supply and demand shocks,

$$X_t = A_0 \in_t + A_1 \in_{t-1} + A_2 \in_{t-2} + A_3 \in_{t-3} + ... = \sum_{i=0}^{\infty} L^i A_i \in_{t-i} \, , \tag{1}$$

where: X_t is a vector of differences of logs of output and prices $[\Delta y_t, \Delta p_t]$', $\in$ is a vector of demand and supply disturbances $[\in_{dt}, \in_{st}]$', A_i are the 2x2 matrices which transmit the effects of the shocks to the variables, and L^i is the lag operator.

The long-run restriction that demand shocks do not affect the level of output is the same as saying that the cumulative effect of demand shocks on the change of output is zero, i.e. $\sum_{i=0}^{\infty} a_{11i} = 0$. Also, it is assumed that supply and demand shocks are uncorrelated and their variance is normalized to unity, i.e. $Var(\in) = I$. A finite version of the model represented by equation (2) can then be used to recover the original supply and demand disturbances. Because the vector X_t is stationary, the VAR representation can be inverted to obtain the Wold moving average representation. Here e_t is the vector of residuals from the two estimated equations,

$$X_t = e_t + C_1 e_{t-1} + C_2 e_{t-2} + C_3 e_{t-3} + ... = \sum_{i=0}^{\infty} C_i e_{t-i} \quad . \tag{2}$$

The variance-covariance matrix of residuals is $Var(e) = \Omega.$. Equations (1) and (2) directly yield the relationship between the estimated residuals (e) and the original $(\in) : e_t = A_0 \in_t$. Therefore, we need to know the elements in A_0 to calculate the underlying supply and demand shocks. The matrices C_i are known from the estimation. Knowing that $A_i = C_i A_0$ and $\sum_{i=0}^{\infty} A_i = \sum_{i=0}^{\infty} C_i A_0$ helps to identify A_0, but to recover the four elements of A_0 we need four restrictions. Two restrictions are simply normalizations that define the variance of the shocks $\in_{dt}$ *and* $\in_{st}$. The third restriction is the assumption that demand and supply shocks are orthogonal, which, according to our notation, means that $A_0 A'_0 = \Omega$. The fourth restriction has already been mentioned, i.e. the long-run response of output to demand shocks is zero. The aforementioned restrictions uniquely determine the elements of A_0, which allows us to recover supply and demand shocks from the residual of an estimated VAR.

In the second approach, we performed also structural VAR models with three variables: GDP growth rate, inflation rate and real effective exchange rate growth rate. Consequently, we identify three types of shocks exerting influence: supply, real demand (IS), and nominal demand. The structural restrictions we implemented are:

- GDP growth rate is in the long-term horizon independent of both real exchange rate and inflation rate.
- Real exchange rate growth rate may in the long-term horizon depend on GDP growth rate, but it is independent of inflation rate.
- Inflation rate may depend on long term on both GDP growth rate and real appreciation rate.

If we label growth rates of GDP, real exchange rate (RER) and CPI as „g“ and structural shocks as „e“, matrix A that passes on the effects of shocks to the three variables for individual countries will have the following form:

$$A = \begin{bmatrix} \frac{\partial g_{GDP}}{\partial e_{GDP}} & 0 & 0 \\ \frac{\partial g_{RER}}{\partial e_{GDP}} & \frac{\partial g_{RER}}{\partial e_{RER}} & 0 \\ \frac{\partial g_{CPI}}{\partial e_{GDP}} & \frac{\partial g_{CPI}}{\partial e_{RER}} & \frac{\partial g_{CPI}}{\partial e_{CPI}} \end{bmatrix}$$

3. Data and results

Our data cover the period 1997Q1-2009Q2 and we used eleven countries from the twelve countries that joined the EU in 2004 and 2007[3], nine countries from the Eurozone (Belgium, Germany, Ireland, Spain, France, Italy, the Netherlands, Austria, and Portugal), two EU member countries outside the Eurozone (Sweden and the United Kingdom) and Croatia. We excluded Malta from the group of NMS and the rest of the countries from European Union because of the lack of data for the entire sample.

We used real GDP data and the GDP deflator. The data are from Eurostat. For Romania, the GDP data on Eurostat are available since 1998. For 1997, the GDP data for Romania is provided by the National Institute of Statistics. Also, for the structural VAR with three variables, we used the real effective exchange rate provided by the Bank of International Settlements.

For the structural VAR decomposition we used the real GDP growth series obtained by first difference of logarithm of real GDP indices with 2000base year (the indices where previously seasonally adjusted with Tramo/Seats) and inflation rate. For inflation we used the first difference of the GDP deflator (seasonality-adjusted with Tramo/Seats).

We used two specifications in our estimations. Firstly, we used a specification with two variables in the structural VAR, namely GDP growth and inflation. Secondly, we used a three variable specification, namely GDP growth, exchange rate and inflation. For both specifications, we used the Akaike information criterion to select the optimal lag length for the VAR.

For the first specification, in the structural VAR we imposed the structural restriction suggested by Bayoumi and Eichengreen (1992), namely that GDP growth rate (aggregate supply curve) is in the long-term horizon independent of inflation rate, but inflation rate may in the long-term horizon depend on GDP growth rate (Philips curve, aggregate demand curve). After we derived the residuals (shocks) for each country we studied the similarity of shocks computing the correlation between demand shocks of a NMS and the Eurozone and afterwards the correlation between supply shocks. The correlations for supply shocks in the case of the entire sample are positive for all the countries (Figure 1). For the sample 2003-2009 (Figure 2), the correlations of supply shocks are also positive for all countries.

Regarding the demand shocks, for the full sample, for all the NMSs the correlations with the Eurozone are negative, the most negative correlation being in the case of Romania. For the 2003-2009 sample, the supply shocks correlations are still negative for most of the NMS countries, excepting Estonia, Hungary, Slovakia, Latvia and Romania.

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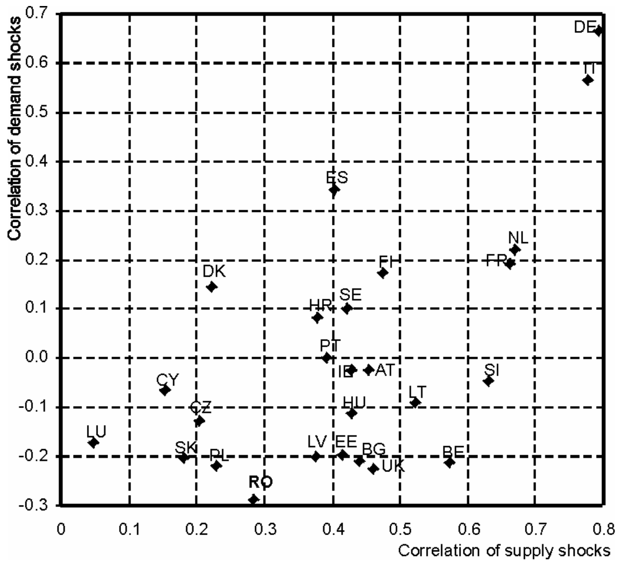
[3] Poland, Czech Republic, Slovakia, Hungary, Slovenia, Estonia, Latvia, Lithuania, Cyprus, Malta in 2004, and Bulgaria and Romania in 2007.

Figure 1

Correlation of demand and supply shocks, 1997-2009



Note : AT: Austria, BE: Belgium, BG: Bulgaria, CY: Cyprus, CZ: Czech Republic, DK: Denmark, DE: Germany, EE: Estonia, FI: Finland, FR: France, GR: Greece, Hu: Hungary IE: Ireland, IT: Italy, LT: Lithuania, LU: Luxembourg, LV: Latvia, NL: Netherlands, PL: Poland, RO: Romania, PT: Portugal, SK: Slovakia, ES: Spain, SI: Slovenia, SE: Sweden, UK: United Kingdom, HR: Croatia.

Figure 2

Correlation of demand and supply shocks, 2003-2009

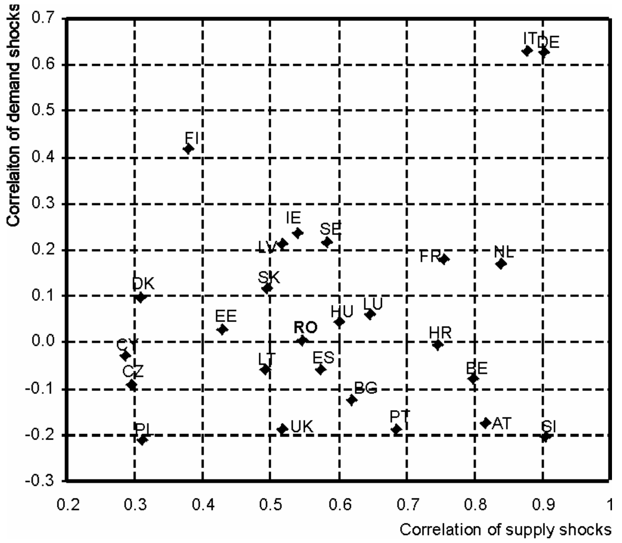


Figure 3

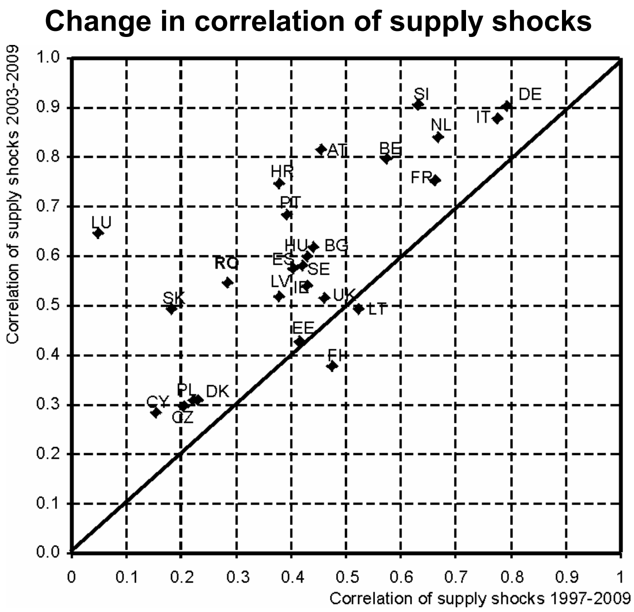
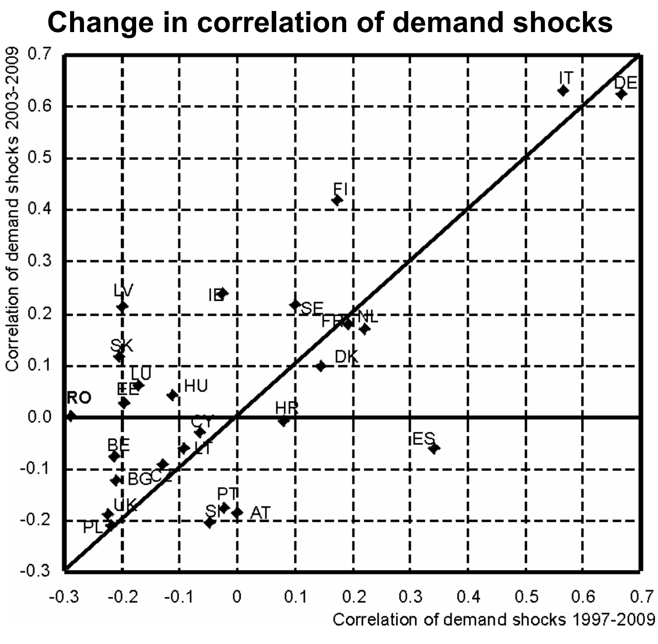


Figure 4



The correlations increased over time for most of the countries in the case of supply shocks (Figure 3), except for Finland and Lithuania. In the case of demand shocks, for a significant number of countries the correlation decreased over time (Figure 4). As expected, the largest members of the Eurozone have the highest correlation of both demand and supply shocks. These countries are clustered. Our findings are quite similar to Fidrmuc and Korhonen (2001).

In the case of Romania, the supply shocks are correlated positively with the Eurozone and the correlation is quite high in the recent period (Figure 5). Nevertheless, in terms of demand shocks, the correlation is very low (Figure 6).

Figure 5

Supply shocks for Romania and the Eurozone, 1997-2009

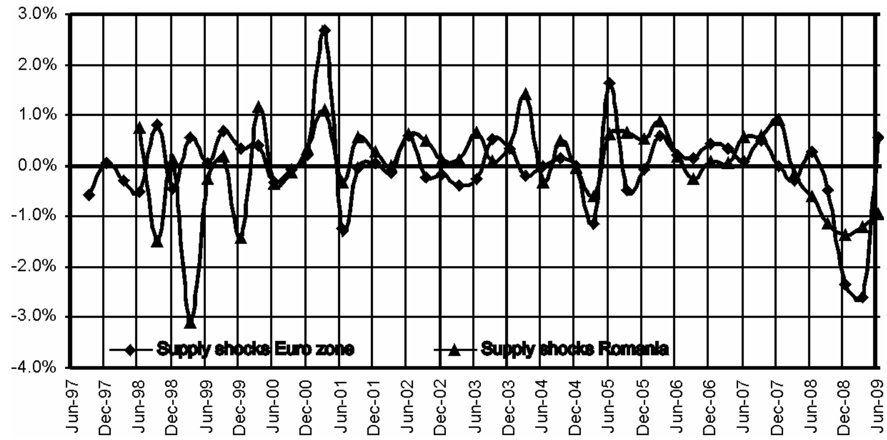
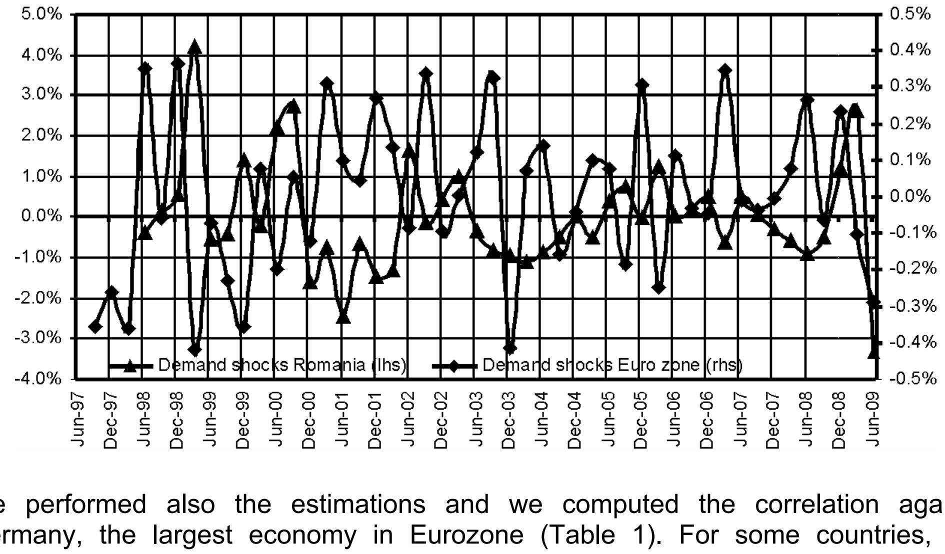


Figure 6

Demand shocks for Romania and the Eurozone, 1997-2009



We performed also the estimations and we computed the correlation against Germany, the largest economy in Eurozone (Table 1). For some countries, the correlation with Germany is higher than in the case of the Eurozone.

Table 1

Correlations of supply and demand shocks with the Eurozone and Germany

	Supply shocks				Demand shocks			
	1997-2009		2003-2009		1997-2009		2003-2009	
	Germany	Euro zone	Germany	Euro zone	Germany	Euro zone	Germany	Euro zone
Austria	0.43	0.45	0.70	0.82	-0.07	-0.02	-0.19	-0.17
Belgium	0.55	0.57	0.66	0.80	-0.17	-0.21	-0.17	-0.08
Cyprus	0.10	0.15	0.21	0.29	-0.03	-0.06	0.08	-0.03
Eurozone	0.79	1.00	0.90	1.00	0.67	1.00	0.63	1.00
Finland	0.36	0.48	0.36	0.38	0.22	0.17	0.58	0.42
France	0.62	0.66	0.65	0.75	0.06	0.19	0.12	0.18
Germany	1.00	0.79	1.00	0.90	1.00	0.67	1.00	0.63
Ireland	0.34	0.43	0.42	0.54	-0.10	-0.02	0.07	0.24
Italy	0.69	0.78	0.82	0.88	0.30	0.56	0.28	0.63
Luxembourg	0.19	0.05	0.59	0.65	-0.02	-0.17	-0.08	0.06
Netherlands	0.73	0.67	0.82	0.84	0.23	0.22	0.25	0.17
Portugal	0.37	0.39	0.48	0.68	-0.08	0.00	-0.19	-0.19
Slovenia	0.62	0.63	0.80	0.91	-0.10	-0.05	-0.30	-0.20
Slovakia	0.16	0.18	0.30	0.49	-0.32	-0.20	-0.12	0.12
Spain	0.34	0.40	0.35	0.57	0.12	0.34	-0.39	-0.06
Denmark	0.33	0.22	0.32	0.31	0.15	0.15	0.17	0.10
Sweden	0.57	0.42	0.65	0.58	0.31	0.10	0.30	0.22
UK	0.42	0.46	0.39	0.52	-0.10	-0.22	-0.13	-0.19
Bulgaria	0.41	0.44	0.47	0.62	-0.03	-0.21	0.15	-0.12
Czech Rep.	0.30	0.21	0.34	0.30	0.14	-0.13	0.06	-0.09
Estonia	0.39	0.41	0.35	0.43	-0.04	-0.20	0.04	0.03
Hungary	0.52	0.43	0.61	0.60	-0.19	-0.11	0.14	0.04
Latvia	0.34	0.38	0.44	0.52	-0.08	-0.20	0.05	0.21
Lithuania	0.35	0.52	0.43	0.49	-0.04	-0.09	0.02	-0.06
Poland	0.21	0.23	0.33	0.31	-0.28	-0.22	-0.27	-0.21
Romania	0.30	0.28	0.55	0.55	-0.33	-0.29	-0.26	0.00
Croatia	0.25	0.38	0.66	0.75	-0.01	0.08	-0.14	-0.01

As expected, the correlation of supply shocks is again positive for both samples and increased in time for all countries excepting Lithuania (Table 2). Even for Lithuania, the correlation of supply shocks with Germany increased. In the case of real demand shocks, the correlation with the Eurozone is positive for all countries from the Eurozone plus Denmark and Sweden. For the UK, the correlations of real demand shocks are negative, as well in the case of Hungary, Latvia and Romania. For the other NMS countries the correlation of real demand shocks is positive, being quite high in Lithuania and Bulgaria. In terms of nominal demand shocks, the correlation is negative for almost all countries, excepting the core countries of the Eurozone. For the NMS, the correlation of nominal demand shocks is positive only for Hungary, Latvia and Romania.

Table 2

Correlation of shocks with Germany and the Eurozone

	Supply shocks				Real demand shocks				Nominal demand shocks			
	DE		EURO		DE		EURO		DE		EURO	
	P1	P2	P1	P2	P1	P2	P1	P2	P1	P2	P1	P2
AT	0.48	0.74	0.47	0.81	0.91	0.90	0.92	0.92	-0.15	-0.30	-0.10	-0.31
BE	0.56	0.68	0.58	0.80	0.86	0.82	0.90	0.87	-0.19	-0.21	-0.23	-0.13
CY	0.01	0.17	0.02	0.21	0.70	0.54	0.73	0.56	-0.07	-0.12	-0.13	-0.25
EURO	0.80	0.91	1.00	1.00	0.98	0.98	1.00	1.00	0.60	0.59	1.00	1.00
FI	0.43	0.53	0.54	0.54	0.85	0.78	0.88	0.80	0.23	0.54	0.13	0.42
FR	0.64	0.65	0.67	0.74	0.75	0.78	0.77	0.79	0.08	0.06	0.20	0.11
DE	1.00	1.00	0.80	0.91	1.00	1.00	0.98	0.98	1.00	1.00	0.60	0.59
IE	0.36	0.40	0.43	0.52	0.85	0.85	0.87	0.89	-0.05	0.11	0.06	0.35
IT	0.71	0.82	0.78	0.87	0.95	0.94	0.97	0.97	0.20	0.32	0.52	0.64
NL	0.73	0.80	0.67	0.82	0.78	0.71	0.83	0.78	0.28	0.37	0.26	0.26
PT	0.45	0.60	0.39	0.75	0.76	0.68	0.76	0.69	0.02	-0.07	0.07	-0.06
SI	0.59	0.76	0.65	0.90	0.58	0.62	0.63	0.70	-0.08	-0.23	0.07	0.00
SK	0.14	0.31	0.17	0.50	0.16	0.46	0.16	0.46	-0.29	-0.30	-0.19	-0.07
ES	0.48	0.50	0.58	0.66	0.86	0.83	0.89	0.88	0.21	-0.44	0.49	-0.01
DK	0.51	0.54	0.40	0.50	0.86	0.78	0.89	0.82	0.14	0.06	0.15	0.12
SE	0.57	0.63	0.46	0.61	0.26	0.44	0.25	0.43	0.33	0.39	0.10	0.20
UK	0.39	0.40	0.48	0.53	-0.06	0.01	-0.08	-0.05	-0.13	-0.15	-0.19	-0.13
BG	0.38	0.42	0.44	0.55	0.38	0.45	0.38	0.45	0.08	0.23	-0.15	-0.08
CZ	0.24	0.30	0.18	0.26	0.29	0.39	0.29	0.36	0.20	0.12	-0.06	0.00
EE	0.41	0.40	0.42	0.53	0.31	0.20	0.40	0.32	-0.03	-0.11	-0.25	-0.18
HU	0.54	0.63	0.42	0.60	-0.09	-0.09	-0.10	-0.11	-0.05	0.35	0.01	0.23
LT	0.33	0.41	0.45	0.41	-0.05	0.66	-0.03	0.68	-0.08	0.00	-0.10	-0.07
LV	0.39	0.51	0.38	0.58	-0.31	-0.19	-0.28	-0.12	0.01	0.03	-0.12	0.22
PL	0.21	0.23	0.18	0.27	-0.20	0.07	-0.23	0.05	-0.34	-0.24	-0.25	-0.16
RO	0.30	0.47	0.28	0.46	-0.09	-0.06	-0.10	-0.09	-0.37	-0.11	-0.22	0.13
HR	0.29	0.69	0.38	0.76	0.07	0.04	0.08	-0.01	-0.15	-0.17	-0.05	-0.07

Note : AT: Austria, BE: Belgium, BG: Bulgaria, CY: Cyprus, CZ: Czech Republic, DK: Denmark, DE: Germany, EE: Estonia, FI: Finland, FR: France, GR: Greece, HU: Hungary IE: Ireland, IT: Italy, LT: Lithuania, LU: Luxembourg, LV: Latvia, NL: Netherlands, PL: Poland, RO: Romania, PT: Portugal, SK: Slovakia, ES: Spain, SI: Slovenia, SE: Sweden, UK: United Kingdom, HR: Croatia. P1: 1997-2009 sample; P2: 2003-2009 sample.

Figure 7

Supply and demand shocks correlation for Romania and the Eurozone, 1997-2009

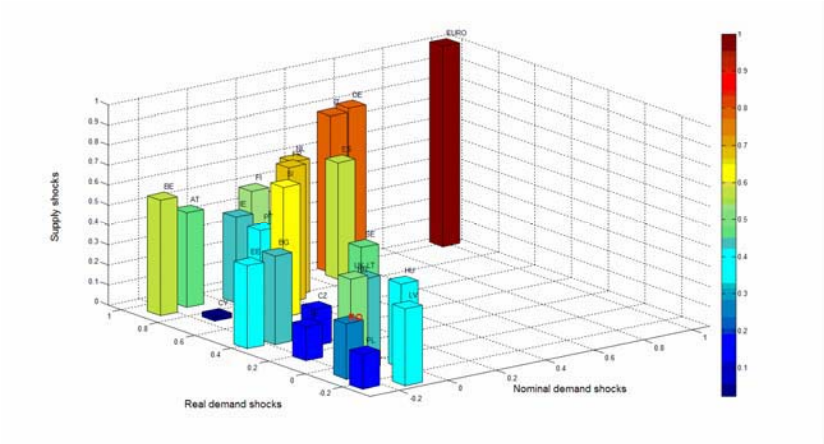
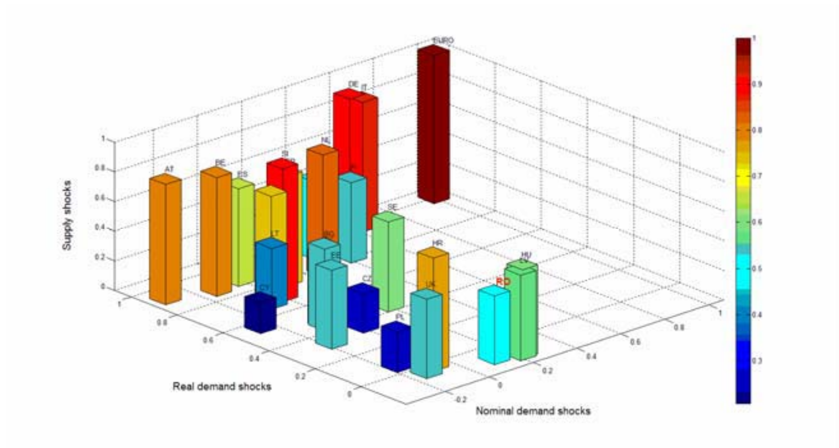


Figure 8

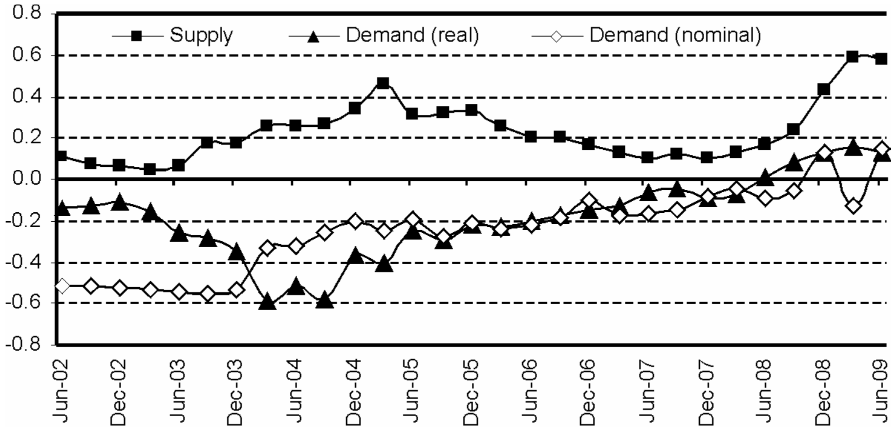
Supply and demand shocks correlation for Romania and the Eurozone, 2003-2009



In order to assess better the development in correlation of demand and supply shocks during last years, we used a rolling window of 5 year to compute the correlation at time *t* based on data on the last five years. As we can see in Figure 9, the corelation of supply shocks was positive during the last years and increased in time towards 0.6. In terms of demand shocks, the correlaiton was negative both in the case of real demand shocks and in the case of nominal demand shocks, but the correlation has become positive in recent period.

Figure 9

Developments of supply and demand shocks correlation (rolling window for last five years)



4. Conclusions

The current international financial and economic crisis deternined a rethinking of the euro adoption strategies of some New Member States (NMS) of the European Union, in order to speed up the process. Some NMSs change their plans and they want to adopt the euro sooner, speeding up the adoption process.

Nevertheless, the euro adoption decision still is a matter of fulfillment of convergence criteria, namely nominal and real convergence indicators. Our results are relevant for the euro adoption decision in the NMSs, as the optimal currency area criteria are important for the assessment of the real convergence process. The the similarity of supply and demand shocks is critical criterion when assessing the costs and advantages of euro adoption.

This paper assessed the degree of readiness of New Member States (NMS) of European Union, including Romania, to adopt euro, mainly based on optimal currency area (OCA) criteria. Using a structural VAR approach, we estimated in the paper the similarity between demand and supply shocks between NMS and Eurozone, showing that the demand shocks are still negatively correlated with the Eurozone for some NMS, including Romania. The correlations for supply shocks in the case of entire sample are positive for all the countries. Regarding the demand shocks, for the full sample, for all the NMSs the correlations with the Eurozone are negative, the most negative correlation being in the case of Romania. For the 2003-2009 sample, the supply shocks correlations are still negative for most of the NMSs, except for Estonia, Hungary, Slovakia, Latvia and Romania.

Another important finding of the paper is that the correlations increased over time for most of the countries in the case of supply shocks, except for Finland and Lithuania. In the case of supply shocks, for a significant number of countries the correlation decreased over time.

In the case of Romania, the supply shocks are correlated positively with the Eurozone and the correlation is quite high in the recent period. Nevertheless, in terms of demand shocks, the correlation is very low.

We also built a structural VAR model with three variables: GDP growth rate, inflation rate and real exchange rate growth rate. The results show that the demand shocks for Romania are negatively correlated with the Eurozone for the full sample, both for real and nominal shocks, but became positive in the recent period for nominal demand shocks.

The main conclusion of our paper is the fact that Romania, as well as some other NMSs, still need time to become more correlated in terms of schocks ocurence and to progress more on the real convergence path in order to adopt the euro without major costs (see also Iancu, 2007).

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